Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Unit 891 – Delayed Coking Unit
Alliance Refinery
ConocoPhillips Company
Belle Chasse, Plaquemines Parish, Louisiana
Agency Interest Number: 2418
Activity Number: PER20080025
Draft Permit No. 2511-V3

I. APPLICANT:

Company:
ConocoPhillips Company
P.O. Box 176, Belle Chasse, LA 70037

Facility:
Alliance Refinery
15551 Hwy 23, Belle Chasse, Plaquemines Parish, Louisiana
Approximate UTM coordinates are 211.51 kilometers East and 3,286.84 kilometers North, Zone 16

II. FACILITY AND CURRENT PERMIT STATUS:

ConocoPhillips Company owns and operates the Alliance Refinery, a petroleum refinery located in Belle Chasse, Louisiana. Gulf Oil Company built the refinery in 1970. BP Oil Company owned Alliance Refinery from 1985 until Tosco Corporation (Tosco) purchased it in September 2000. Tosco later became a wholly owned subsidiary of Phillips Petroleum Company on September 17, 2001. On August 30, 2002, Phillips Petroleum Company, including its subsidiary Tosco Corporation, completed a merger with Conoco Inc. to form ConocoPhillips Company. On January 1, 2003, the owner and operator of the Alliance Refinery formally changed from Tosco to ConocoPhillips Company. The processing units in Alliance Refinery operate under several Part 70 permits.

Alliance Refinery produces a wide range of petroleum products from crude oil, such as motor gasoline, jet fuel, diesel fuel, LPG, carbon black feedstock, propane, and coke. It also produces by-product elemental sulfur and petrochemicals such as benzene, toluene, and xylene.

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The 891-Delayed Coking Unit thermally cracks crude unit vacuum tower bottoms into the following products:

Petroleum coke
Coker gas oil
Coker furnace oil
Coker gasoline
C_3 - C_4 Liquid Fraction

The unit consists of a charge heater, steam generation equipment, two coke drums, fractionation, light ends recovery, and coke handling facilities. Feed for the unit comes from vacuum tower bottoms (Crude Unit 191) and refinery slop oil. Fluidized Catalytic Cracking Unit (Unit 1291) decanted oil may also feed the delayed coking unit.

Several Part 70 and PSD permits addressing portions of the facility have already been issued. These include:

Permit Number	Units or Sources	Unit Name	Date Issued
PSD-LA-75(M-2)	Unit 301	Boilers	10/13/1987
PSD-LA-624	Source 301-B-3	Supplemental Boiler	09/16/1998
2593-V1	Unit 293	Gulfining Unit	04/11/2007
2113-V1	Unit 292	Diesel Hydrotreater Unit	09/10/2007
2513-V5	Unit 412	Offsites	04/16/2009
2776-V1	Unit 7591	Merox Treater Unit	01/03/2008
2511-V2	Unit 891	Delayed Coking Unit	11/16/2005
2840-V1	Unit 294	Low Sulfur Gasoline Unit	08/03/2007
PSD-LA-696	Unit 294	Low Sulfur Gasoline Unit	10/03/2003
2512-V2	Unit 491 & Unit 6191	HF Alkylation & Light Ends Recovery Unit	04/16/2009
2778-V1	Unit 303	Utilities	03/26/2009
2774-V3	Unit 591/592	Sulfur Recovery Unit	05/05/2009
1810-V2 AA	Unit 1291/301	Fluidized Catalytic Cracking Unit/CO Boilers	01/30/2007
1870-V0	Unit 308W	Wastewater Treatment Unit	08/23/2005
2313-V1	Unit 406	Marine Loading and Transfer Operations	02/28/2008
2180-V0	Unit 191/7991	Crude and Saturate Gas Unit	04/25/2006
2779-V2	Unit 308F	Flares Unit	03/06/2009
2775-V1	Units 291/1391/1791/1792	Naphfining, Catalytic Reforming, Aromatic Extraction, and Thermal Hydrodealklylation Units	10/01/2008

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III. PROPOSED PERMIT / PROJECT INFORMATION:

Permit Application Submittal Information

ConocoPhillips submitted an application and Emission Inventory Questionnaire (EIQ) dated December 15, 2008, requesting a Part 70 permit renewal/modification for Unit 891 – Delayed Coking Unit.

Project description

Conoco proposes the following changes:

- Delete the Delayed Coking Charge Heater, Emission Point No. 891-H-2. As a part of the Advantage Crude Project approved in the previous Permit modification, the Delayed Coking Unit was being upgraded to include the removal of the Delayed Coking Charge Heater, Emission Point No. 891-H-1, and the addition of the Delayed Coking Charge Heater, Emission Point No. 891-H-2. ConocoPhillips has decided not to move forward with the construction of the new heater; therefore, it is being deleted from the permit. The Delayed Coking Charge Heater, Emission Point No. 891-H-1, is being brought back in this permit since it will remain in operation.

- Reconcile fugitive emissions with updated emission factors and component counts for Unit Fugitives for Delayed Coking Unit, Emission Point No. 891-FF.

- Reconcile the heater emissions based on new API emission factors. This adds a number of Toxic Air Pollutants (TAPs) to the emissions estimates for the heater.

Permitted Air Emissions

Estimated emissions in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	8.09	8.29	+ 0.20
SO_2	22.86	23.56	+ 0.70
NO_X	33.99	148.04	+114.05**
CO	70.02	17.78	- 52.24
VOC *	56.88	52.20	- 4.68

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Pollutant	Before	After	Change
Lead	-	0.003	+ 0.003

**The upgrade of the Delayed Coking Unit will not be pursued at this time so emissions of NO_X are reverting back to the pre-project permitted emissions.

*VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs) in TPY:

Pollutant	Before	After	Change
Acetaldehyde	-	0.011	+0.011
Acrolein	-	0.015	+0.015
Benzene	0.20	0.236	+0.036
1,3-Butadiene	0.02	0.019	-0.001
Cresols	<0.01	0.003	+0.003
Cumene	0.02	0.017	-0.003
Ethylbenzene	0.11	0.112	+0.002
Formaldehyde	-	0.046	+0.046
n-Hexane	1.54	1.394	-0.146
Naphthalene	0.20	0.176	-0.024
Phenol	-	0.004	+0.004
PAH	-	<0.001	-
Toluene	0.26	0.365	+0.105
2,2,4-Trimethylpentane	0.13	0.118	-0.012
Xylenes	0.41	0.388	-0.022
Total	2.89	2.904	+0.014
Other VOC	53.99	49.296	-4.694

NON-VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before	After	Change
Antimony	-	<0.001	-
Arsenic	-	0.001	+0.001
Barium	-	0.005	+0.005
Beryllium	-	<0.001	-
Cadmium	-	0.001	+0.001
Chromium VI	-	0.005	+0.005
Copper	-	0.004	+0.004

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NON-VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before	After	Change
Manganese	-	0.004	+0.004
Mercury	-	<0.001	-
Nickel	-	0.007	+0.007
Selenium	-	0.001	+0.001
Sulfuric Acid	0.28	0.290	+0.010
Zinc	-	0.046	+0.046
Total	0.28	0.364	+0.084

Prevention of Significant Deterioration Applicability

Since there are no physical modifications with this application, a Prevention of Significant Deterioration analysis is not required.

This application was reviewed for compliance with the Part 70 operating permit program. It was also reviewed for compliance with Louisiana Air Quality Regulations, National Emission Standards for Hazardous Air Pollutants (NESHAP), and New Source Performance Standards (NSPS). Prevention of Significant Deterioration (PSD) does not apply.

MACT requirements

ConocoPhillips complies with the federal fugitive emissions standards through the Louisiana Fugitive Emission Consolidation Program, with which it agreed to comply in 1998 (through its predecessor BP Oil). Alliance Refinery is a major source of toxic air pollutants subject to Maximum Available Control Technology (MACT) standards. The Delayed Coking Unit as part of the refinery is also subject to MACT, specifically the *Louisiana MACT Determination for Refinery Equipment Leaks*, issued July 26, 1994. Under the Fugitives Consolidation Program this is the most stringent of the programs applicable to the Delayed Coking Unit. Alliance Refinery operates under Air Toxics Compliance Plan No. 92031 approved June 16, 1995.

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Air Modeling Analysis

Dispersion Model(s) Used: ISCST3 (Screen by LDEQ)

Pollutant	Time Period	Calculated Maximum Ground Level Concentration	Louisiana Air Quality Standard (NAAQS)
NO_X	Annual	20.56 $\mu g/m^3$	(100 $\mu g/m^3$)
SO_2	3-hour	455.88 $\mu g/m^3$	(1300 $\mu g/m^3$)
	24-hour	264.25 $\mu g/m^3$	(365 $\mu g/m^3$)
	Annual	25.31 $\mu g/m^3$	(80 $\mu g/m^3$)

The dispersion model was run for the Clean Fuels project. The screening model results for SO_2 were added to the Clean Fuels results since the 2005 flare study resulted in a significant increase of SO_2 emission estimates.

Impact on air quality from Unit 891 – Delayed Coking Unit will be below the National Ambient Air Quality Standards (NAAQS) and the Louisiana Ambient Air Standards (AAS) beyond industrial property.

General Condition XVII Activities

The facility will comply with the applicable requirements of General Condition XVII of the Louisiana Air Emission Permit General Conditions in the Title V Permit. For a list of approved General Condition XVII Activities, refer to Section VIII of the draft Part 70 permit. These releases are small and will have an insignificant impact on air quality.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to Section IX of the draft Part 70 permit.

IV. Permit Shields

A permit shield was not requested.

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V. Periodic Monitoring

For the Delayed Coker Charge Heater, Emission Point No. 891-H-1, ConocoPhillips is required to monitor H_2S concentration in the fuel gas with a Continuous Emission Monitor (CEM) as per NSPS, Subpart J, which was mandated by the Consent Decree (Civil Action H-05-0258 lodged January 27, 2005). Fugitive emissions must be monitored according to the provisions of Louisiana Refinery MACT

VI. Applicability and Exemptions of Selected Subject Items

Regulatory applicability, standards, monitoring, reporting and recordkeeping requirements are provided in the Facility Specific Requirements Section of the draft permit. The table below summarizes highlights of the regulatory applicability for each emission point.

Source ID No.:	Requirement	Applicability
Facility - Unit 891	NESHAP Benzene Waste Operations 40 CFR 61, Subpart FF	Refinery has > 10 Mg/yr benzene from waste and is subject to Subpart FF; it must meet control, reporting, and recordkeeping requirements. (See Title V Permit, Unit 308W, Wastewater Treatment Unit.)
Facility - Unit 891	NSPS Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems 40 CFR 60, Subpart QQQ	Unit's wastewater streams are subject to standards of Subpart QQQ. All refinery wastewater streams are incorporated under separate Title V Permit (Unit 308W, Wastewater Treatment Unit), which includes all refinery wastewater collection and treatment systems.
891-H-1 Delayed Coker Charge Heater	NSPS Standards of Performance for Petroleum Refineries 40 CFR 60, Subpart J	40 CFR 60.104: Standards for Sulfur Oxides. Fuel gas shall not contain > 0.1 gr/dscf of H_2S (3-hour rolling average).
891-H-1 Delayed Coker Charge Heater	Control of Emissions From Smoke LAC 33:III.1101.B	Emissions of smoke shall be controlled so shade is not darker than 20% average opacity, except that emitted during maintenance, shutdown, startup, etc., can have opacity greater than 20 percent for not more than one 6-minute period in any 60 consecutive minutes.
891-H-1 Delayed Coker Charge Heater	Emission Standards for Particulate Matter (Including Standards for Some Specific Facilities) LAC 33:III.1313.C (Subchapter C)	Particulate matter limit = 0.6 lbs/MM BTU of heat input.

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Source ID No.:	Requirement	Applicability
891-H-1 Delayed Coker Charge Heater	Emission Standards for Sulfur Dioxide LAC 33:III.1503.C	EXEMPT. Flue gas SO_2 concentration shall not exceed 2,000 ppmv (3-hr avg). Units emitting less than 250 tons per year of sulfur compounds measured as SO_2 may be exempted by the administrative authority. Must comply with recordkeeping requirement.
891-CP Coke Transfer and Storage	Emission Standards for Particulate Matter; Provisions Governing Specific Activities LAC 33:III.1303.B	Emissions which pass onto or across a public road and create a traffic hazard by impairment of visibility are prohibited.
891-CP Coke Transfer and Storage	Emission Standards for Particulate Matter; Control of Fugitive Emissions LAC 33:III.1305	All reasonable precautions shall be taken to prevent PM from becoming airborne.
891-FF Unit Fugitive Emissions	NESHAP National Emission Standard for Equipment Leaks of Benzene 40 CFR 61, Subpart J	DOES NOT APPLY. Equipment contains or contacts a fluid that is <10% benzene.
891-FF Unit Fugitive Emissions	NESHAP National Emission Standard for Equipment Leaks 40 CFR 61, Subpart V	DOES NOT APPLY. Equipment contains or contacts a fluid that is <10% VHAP as defined under Part 61.
891-FF Unit Fugitive Emissions	LAC 33:III.Chapter 51, LA MACT for Refineries 40 CFR 63, Subpart CC, NESHAP for Petroleum Refineries 40 CFR 60, Subpart GGG NSPS VOC Equipment Leaks, Petroleum Refineries LAC 33:III.2121 Louisiana Fugitive Emission Control	Comply with Louisiana MACT for Refineries in accordance with streamlined fugitives monitoring program defined in Part 70 Specific Condition in Appendix A.
891-FF Unit Fugitive Emissions	Control of Emission of Organic Compounds LAC 33:III.2111	All rotary pumps and compressors handling volatile organic compounds having true vapor pressure of 1.5 psia or greater shall be equipped with mechanical seals or equivalent approved equipment.

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VII. Streamlined Requirements

Unit or Plant Site	Programs Being Streamlined	Stream Applicability	Overall Most Stringent Program
891-Delayed Coking Unit	LAC 33:III.Chapter 51, LA MACT for Refineries	≥ 5% VOTAP (Class I + II)	LA MACT for Refineries
	40 CFR 63, Subpart CC, NESHAP for Petroleum Refineries	≥ 5% OHAP	
	40 CFR 60, Subpart GGG NSPS-VOC Equipment Leaks in Petroleum Refineries	≥ 10% VOC	
	LAC 33:III.2121 - Louisiana Fugitive Emission Control	≥ 10% VOC	

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VIII. Glossary

Best Available Control Technologies (BACT) - An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under this part which would be emitted from any proposed major stationary source or major modification which the administrative authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

CAM - Compliance Assurance Monitoring rule – A federal air regulation under 40 CFR Part 64

Carbon Black - A black colloidal substance consisting wholly or principally of amorphous carbon and used to make pigments and ink.

Carbon Monoxide (CO) – (Carbon monoxide) a colorless, odorless gas produced by incomplete combustion of any carbonaceous (gasoline, natural gas, coal, oil, etc.) material.

Cooling Tower – A cooling system used in industry to cool hot water (by partial evaporation) before reusing it as a coolant.

Continuous Emission Monitoring System (CEMS) – The total combined equipment and systems required to continuously determine air contaminants and diluent gas concentrations and/or mass emission rate of a source effluent.

Cyclone – A control device that uses centrifugal force to separate particulate matter from the carrier gas stream.

Duct Burner – A device that combusts fuel and that is placed in the exhaust duct from another source (such as a stationary gas turbine, internal combustion engine, kiln, etc.) to allow the firing of additional fuel to heat the exhaust gases before the exhaust gases enter a steam generating unit.

Federally Enforceable Specific Condition - A federally enforceable specific condition written to limit the potential to Emit (PTE) of a source that is permanent, quantifiable, and practically enforceable. In order to meet these requirements, the draft permit containing the federally enforceable specific condition must be placed on public notice and include the following conditions:

- A clear statement of the operational limitation or condition which limits the source's potential to emit;
- Recordkeeping requirements related to the operational limitation or condition;
- A requirement that these records be made available for inspection by LDEQ personnel;

- A requirement to report for the previous calendar year.

Grandfathered Status- Those facilities that were under actual construction or operation as of June 19, 1969, the signature date of the original Clean Air Act. These facilities are not required to obtain a permit. Facilities that are subject to Part 70 (Title V) requirements lose grandfathered status and must apply for a permit.

Heat Recovery Steam Generator (HRSG) – A steam generator that recovers exhaust heat from a gas turbine, and provides economizing and steam generation surfaces.

Hydrogen Sulfide (H_2S) - A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the action of acids on metallic sulfides, and is an important chemical reagent.

Maximum Achievable Control Technology (MACT) - The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

NESHAP - National Emission Standards for Hazardous Air Pollutants –Air emission standards for specific types of facilities, as outlined in 40 CFR Parts 61 through 63

Nitrogen Oxides (NO_x) - Compounds whose molecules consists of nitrogen and oxygen.

Nonattainment New Source Review (NNSR) - A New Source Review permitting program for major sources in geographic areas that do not meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. Nonattainment NSR is designed to ensure that emissions associated with new or modified sources will be regulated with the goal of improving ambient air quality.

NSPS - New Source Performance Standards – Air emission standards for specific types of facilities, as outlined in 40 CFR Part 60

Organic Compound - Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit- Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$ 10 tons per year of any toxic air pollutant; $\geq$ 25 tons of total toxic air pollutants; and $\geq$ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10}- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) - The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Selective Catlaytic Reduction (SCR) – A noncombustion control technology that destroys NO_X by injecting a reducing agent (e.g., ammonia) into the flue gas that, in the presence of a catalyst (e.g., vanadium, titanium, or zeolite), converts NO_X into molecular nitrogen and water.

Sulfur Dioxide (SO_2) – An oxide of sulfur.

TAP - Toxic Air Pollutant (LDEQ acronym for air pollutants regulated under LAC 33 Part III, Chapter 51, Tables 1 through 3).

Title V permit – See Part 70 Operating Permit.

"Top Down" approach – An approach which requires use of the most stringent control technology found to be technically feasible and appropriate based on environmental, energy, economic, and cost impacts.

Turbine – A rotary engine in which the kinetic energy of a moving fluid is converted into mechanical energy by causing a bladed rotor to rotate.

Volatile Organic Compound (VOC) - Any organic compound which participates in atmospheric photochemical reactions; that is, any organic compound other than those which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.